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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,563	04/14/2004	Masaya Katsumata	251853US3	4818
22850	7590	12/13/2004		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
			EXAMINER FLANIGAN, ALLEN J	
			ART UNIT 3753	PAPER NUMBER

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/823,563	Applicant(s) KATSUMATA ET AL.	
	Examiner Allen J. Flanigan	Art Unit 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Claim 4 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot serve as the basis for another multiple dependent claim. See MPEP § 608.01(n).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timsit et al. in view of Evans et al.

Timsit et al. disclose a brazing sheet that uses a core aluminum alloy (AA 6000 series) with Mg and Si as the principle alloying ingredients. Rather than applying a conventional AlSi braze cladding and then applying flux using spraying, slurry, etc. Timsit et al. employ a mixed coating combining eutectic brazing compound and flux components with a binder. Silicon is a preferred brazing component of the coating, and numerous flux compounds are mentioned as the flux component of the coating, including zinc chloride and mixtures with ZnCl (top of column 3) as well as potassium fluorinate based fluxes. Additionally, Timsit et al. suggest the advantages of adding Zn to the coating mixture (lines 30-33 of column 3).

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Evans et al. show that it is known to use the 6000 series core alloys, silicon-containing brazing materials, and fluxes discussed in Timsit et al. in constructing heat exchanger tubes. Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to use the brazing coating taught in Timsit et al. to form heat exchanger tubes suitable for brazing into an assembled heat exchanger as shown in Evans et al. in view of the advantages ascribed to the "combined" silicon brazing material and flux powder coating taught in Timsit et al.

Regarding the specific coating amounts claimed, Timsit et al. suggest a preferred brazing metal/flux ratio of 1:3 (see lines 10-11 of column 3, also Examples 1-5), and a loading of from 10-130 g/m², dried weight. At the lower end of this preferred loading range, the ratio of Si to flux based on the preferred 1:3 ratio would give approximately 2.5 g/m² for the Silicon powder and 7.5 g/m² for the flux. Note also the example given in Table 5 listing a particle size of 10µm, and a coating weight of 20.4 g/m². This gives a silicon loading of about 5.1 g/m² and a flux loading of 15.3 g/m².¹

¹ Although the more preferred ranges of coating thickness/"loading" given in the illustrative examples tend to be outside the claimed range, some examples were run that did fall within the lower range of the total preferred thickness as low as 10 g/m²; see for example the first example given in Table 7, with a clad thickness of 0.01 mm, Si 4.1 g/m². Applicant should bear in mind that the prior art is available for all that it teaches, and nonpreferred embodiments are just as valid a basis for a finding of anticipation/nonobviousness as preferred embodiments. See MPEP 2123, and note also the corollary statement regarding preferred embodiments not constituting a "teaching away" from nonpreferred embodiments. Further, regarding the example from Table 5 of Timsit et al. noted above, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close

Regarding claim 3, the preferred particle size for the coating in Timsit et al. is claimed as from 5-50 μ m, with particle sizes of from 10 μ m to 20 μ m giving good results.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Timsit et al. in view of Evans et al as applied to claims 1-3 above, and further in view of the Key to Metals webpage on AlMgSi 6000 alloys, and Shepelev et al.

The specific alloy given in the illustrative examples of Timsit et al., AA6061, is listed as having a manganese content of only .001 percent by weight; however, alloys of the 6000 series in general are suggested as appropriate for the invention (in both Timsit et al. and Evans et al), and the reprint of "Aluminum-Magnesium-Silicon (6000) Alloys" from the website found at:

<http://www.key-to-metals.com/Article74.htm>

indicates that manganese may be added in amounts up to 1.5% to act as an iron corrector. Shepelev et al. explain that such correctors are useful to prevent relatively high amounts of iron impurities in the alloy from negatively affecting its properties (brittleness). Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to use an alloy containing an appropriate amount of Mn to negate the presence of any

iron impurities that might negatively affect the mechanical properties of the alloy.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


The remaining references show various aluminum alloy brazing methods/coatings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen J. Flanigan whose telephone number is (571) 272-4910. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Mancene can be reached on (571) 272-4930. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Allen J. Flanigan
Primary Examiner
Art Unit 3753

AJF